

HNI

6S - Visual Management



Do-er's Manual

Do-er: _____

By signing here; I personally commit to continuously applying these "lessons learned" to my own area of responsibility.

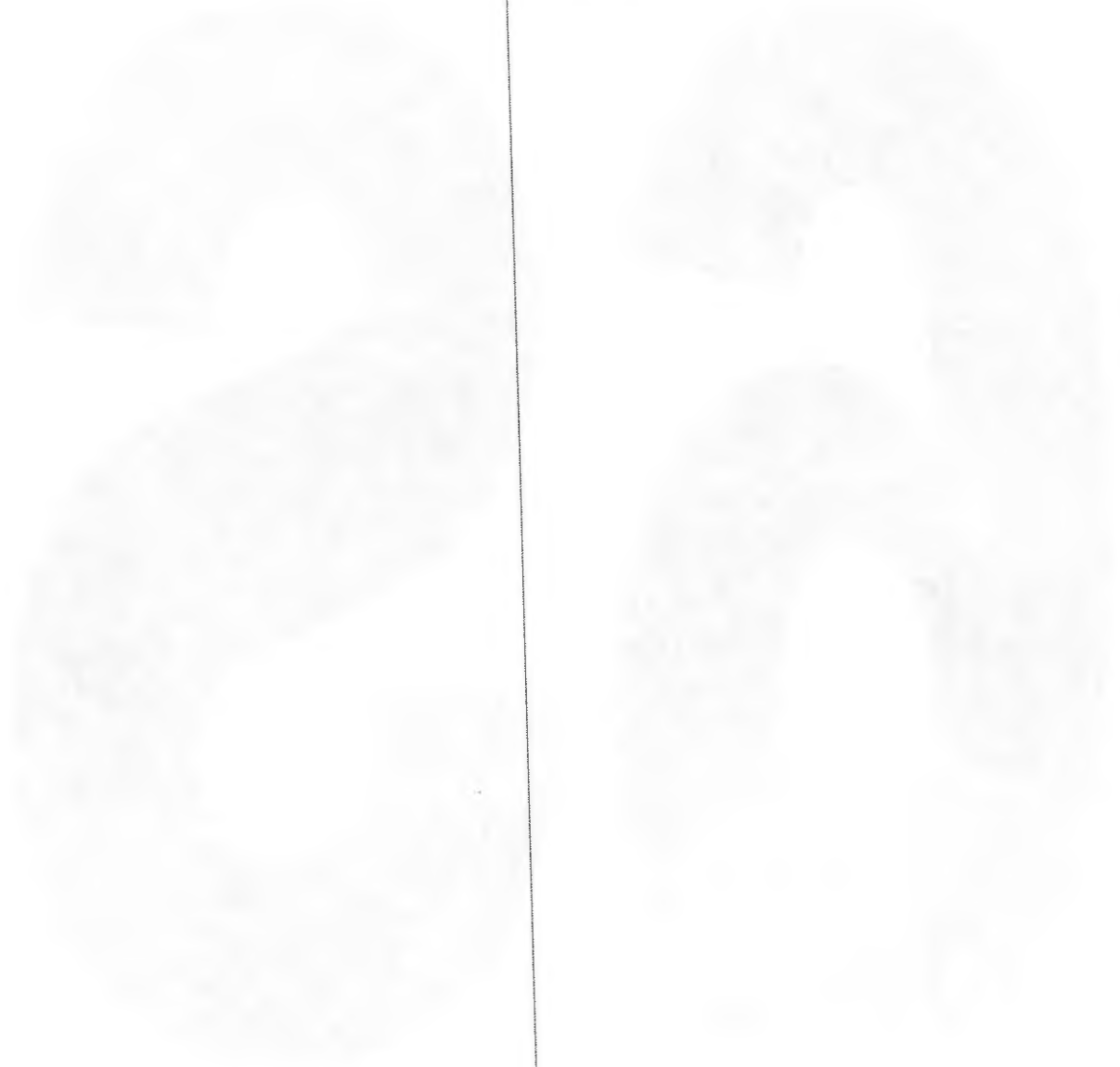
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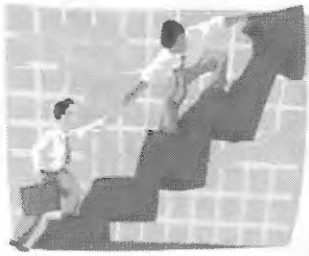
HNI



The First Step to Visual Management



The First Step towards Visual Management



Sustain
Standardize
Safe
Scrub
Straighten
Sort

Creating a culture which perpetuates a clean, organized, safe, visual and efficient workplace for all members.

The foundation for the 6S's is derived from the Japanese practice of 5S. Taken from the first letters of the Japanese words Seiri, Seiton, Seiso, Seiketsu and Shitsuke, the 5S's are a disciplined approach towards maintaining and improving the work place. Although Japanese to English translations often vary, the following meanings were chosen to continue using the simplicity of the 5S acronym while at the same time adding a sixth S: (Safe).

There is a hierarchy to the implementation of the 6S's. We must start with the 1S and complete it before advancing to the 2S. Then complete the 2S before beginning on the 3S, etc. Think about it, straightening up and organizing things that you don't need makes very little sense; instead, get rid of them.

But before beginning at all we must tackle one of the toughest challenges of a 6S campaign...**changing our mindset**. An attitude that workplace cleanliness and organization is necessary to the well being of our company is the foundation for 6S. Without this, 6S will surely not sustain itself.

Continued practice of the housekeeping principles requires constant attention and vigilance. Allowing 6S to become nothing more than an RCI clean-up campaign will not forward this cause. Therefore, the affected members must be willing to take ownership of 6S in their area and commit it to habit. Without this commitment and ownership to 6S, continuous improvements in the workplace will not be maintained.

6S

The meaning of 6S is "common sense."

6S is a team activity with each member knowing what their job entails.

If you can't do 6S, you can't do the other work.

6S sets the stage for Just-in-Time production.

Achieving 6S is difficult because it looks so easy.

6S is a barometer of how well a company is run.

Working with many of the ShingiJutsu consultants has given us many opportunities to hear comments regarding 6S. Most concern its relationship to JIT and the continuous improvement process. Shown in the slide are just a few.

Common Sense- 6S is not rocket science. It is a set of very simple rules that, if obeyed, will maintain cleanliness and order. Often the things that would assist in facilitating workplace 6S; we already do in our home life. Doing the dishes after dinner is no different than daily clean-up of our workplace, but often this task does not occur.

Team Activity- For 6S to work well, it must become a team activity with all members pulling equal weight. If everyone does their part....the workplace will remain organized.

Can't do 6S- If you can't do 6S, you can't do the other work. Many believe 6S is a wasteful process and therefore, would be better left undone. Nothing could be further from the truth. The essence of 6S is to maintain a clean, orderly, safe and productive workplace. Not embracing 6S jeopardizes all of these.

6S is Difficult- Many people believe that doing 6S is easy. Those that believe this have never achieved true 6S. Getting to 6S-Sustain, will require considerable time, effort and follow-up. While the steps of 6S are simple...putting them in practice is NOT easy.

Barometer- Fortunately or maybe unfortunately, many companies are not in the food processing or medical industry. There an unsightly, dirty environment would result in ceasing of operations until the problem corrected. So to combat that from happening, cleanliness and organization must be built into the culture of their manufacturing environment. Even though we manufacture wood and metal products, we should develop the same culture. Rather than be constantly cleaning, however, let us find a way to keep our workplaces from getting dirty. This is the best approach for all of HNI Corporation.

6S is the Foundation for Visual Management



The ESSENCE of a Lean Enterprise is to drive out waste and abnormalities. Making it easy for anyone to spot the difference between a NORMAL and ABNORMAL situation is the key to a defect and error free enterprise. But doing this is NOT about implementing some new computer system. It is about the progression of VISUAL MANAGEMENT. And it begins with 6S.

Without workplace organization as the foundation for our visual management pyramid, the other parts will not sustain themselves.

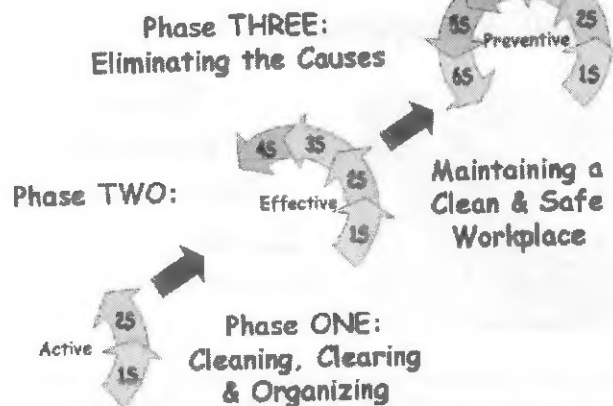
Base Level: 6S - Workplace Organization

This amounts to a concerted effort aimed at Separating, Organizing, Standardizing and Sustaining the conditions of the workplace. It evolves through the S's, one at a time beginning with 1S-Sort.

Second Level: Visual Displays With the workplace organization maintained, we may begin to communicate the workplace standards through the use of visual displays. These amount to standard work documentation, work standards (feeds, speeds, temperatures, conditions, etc) documentation. Typically these are posted in the workplace.

Third Level: Visual Controls: This amounts to building standards directly into the workplace. In other words, the layout, jigs, fixtures, machines and containers allow the work to progress in a prescribed manner. If an abnormality occurs, the operator is warned, or it is automatically detected and prevented. The highest level can even detect errors and thus eliminating defects.

Phases of 6S:



Understanding the benefits of the Housekeeping principles is a beginning; now let's see how to put them to work. First, don't expect everyone to immediately jump on the band wagon and share your enthusiasm. It won't happen. Our job should be to train, coach and encourage all HNI Corporation members towards achieving the objectives of 6S.

Phase 1 (The ACTIVE Phase: 1S & 2S)

This phase involves initial cleaning, organizing and establishment of for daily cleaning activities. This will involve standardizing of routines, locations, indicators and the like. Expect that this will take much follow-up and auditing to prevent backsliding. Even though we have made a big impact in the appearance of the work area, sustaining this effort is paramount.

Phase 2 (The Effective Phase: 3S & 4S)

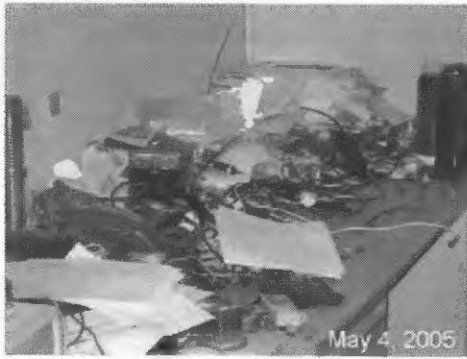
When suddenly you have entered this phase, the need for prodding and follow-up is starting to abate. Members are beginning to recognize the importance of the 6S's and are often the biggest advocates. They have developed an ingrained habit for housekeeping and will find better ways to improve. Small messes are cleaned immediately instead of at end of shift. Control is exercised to prevent contamination from spreading. Autonomous activities to address problems are initiated and completed. Kaizen of the housekeeping process reduces its time. Backsliding is minimal and auditing can be done less often. Competitiveness between areas will result as pride in their workplace expands. We're almost there!

Phase 3 (The Preventive Stage: 5S & 6S)

Faced with daily cleaning of the workplace, members will begin to ask "how can we keep the workplace from getting dirty". This proactive approach to 6S addresses the causes of contamination, attacks it at its source and eliminates it. The workplace will remain clean even during production time because the causes have been identified and eliminated. To be successful, the gradual road to attaining a clean, safe and productive workplace is the sure road.

Document the Current Condition

Take lots of photographs



Determine Position and Date

Like any improvement effort, it is very important that we first document the "status quo" (current condition). If we don't, we will often forget how bad it really was before.

Therefore, before beginning a 6S campaign in a area, take time to photograph the area. Be sure to record the date and the position the picture was taken. Then it will be possible in the future to replicate the shot and show the improvement efforts.

While this is often regarded as unnecessary, it is amazing how quickly we forget how bad it really was. I reminder will help us jog our memory.

Sort 1S

Sort

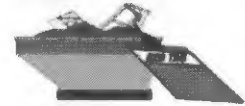
"Separating the Necessary from the unnecessary"

Begin With 1S - Sort.



A major cleaning (rafters to floor) of the plant or department.

Discard broken or unnecessary items.
Determine what's actually needed in the work area. "Red Tag Session"



Use 80/20 Principle to evaluate remaining items.

Develop listing of what is **REQUIRED** in each area and then keep only those items in the workplace.

In each workplace there are tools, parts, trash and other items which inhibit our ability to "add value" to the product. Not only do these things hamper our performance, but they also contribute to unsafe working conditions and quality problems. Often, they prevent us from noticing a machinery malfunction which can eventually lead to a breakdown.

To prevent this from happening, it is very important to begin the 6S process by performing a sorting out and organization of the workplace. This is the first S. It consists of the following actions.

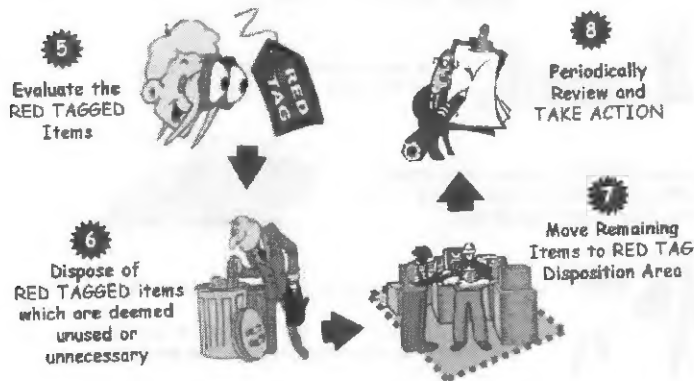
- A major cleaning of the workplace area.
- Disposing of items that are broken or no longer necessary.
- Use "**Rules of Frequency**" to keep only a limited quantity in the work area.

On the surface, this appears to be one of the easiest things to do in continuous improvement. In reality, it is one of the toughest. Trying to come to an agreement on **WHAT IS** required in the work area is usually a very difficult and argumentative task. In many cases a clean up occurs, however, items which should have been removed remain in the workplace. Human beings have been programmed to hold onto things (even those we no longer use) because we assume that they have value.

In order to make the Sort (1S) easier, many use the **RED TAG** campaign. This allows you to seal the wastes, identify them for what they are and eventually get rid of them.

Conducting a RED TAG Campaign

SEAL the wastes, EXPOSE them then DISPOSE of them



Decide upon the extent of the activity and the target you wish to achieve. Get organized. This is an exercise in reviewing the who, what, where, when, why and how.

Identify the Target for RED TAGGING. You can't clean the whole world, therefore, accurately define the scope of the area in which you plan to do the tagging and stick to that area. Once completed, you can move onto other areas. ie; **STAY FOCUSED!**

Using sample RED TAG Criteria in the Appendix as a guide, define the criteria for which you will red tag something. This way everyone can objectively determine if an item in the workplace should be red tagged. The criteria is by different classifications of items and often regards excessive quantities or time. ie.: Tag if quantity is greater than one day supply; tag if machine has not been used for 21 days, tag if greater than one week supply. Also, you may have a general criteria such as; if not used in the area...RED TAG it. These criteria should all be determined for your plant or factory and defined before you hit the shop floor. Be sure to examine what tools, parts and equipment is needed to perform **STANDARD WORK**.

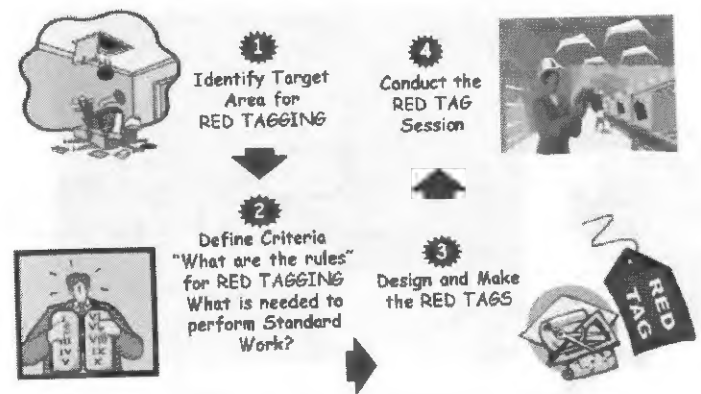
Again, using the example in the appendix, modify the RED TAG to suit your plant's application. Print the page on red paper so that they can easily be stopped in the plant and not confused with other paperwork attached to items.

Conduct the RED TAG Session. Beginning at one end of the defined area, progress through the area and RED TAG anything that meets the established criteria. Don't get into arguments regarding whether items should be tagged or not while on the shopfloor; we will review each item later. If not sure...TAG IT! Remove the upper portion of the RED TAG and leave the RED TAG locator taped onto the item tagged. This will help us find it later

Remember: Trash is trash and should be disposed of immediately. Don't waste your time and the time of others tagging such items as damaged cartons, empty soda cups, broken pallets, etc. Just get rid of them.

Conducting a RED TAG Campaign

SEAL the wastes, EXPOSE them then DISPOSE of them



After the tagging session, the team will convene and review the tags issued. Because **"one person's trash is another person's treasure"**, when evaluating the red tagged items it is very important to assign a final decision maker.

This Final Decision Maker must be someone with the authority and awareness to make a tie-breaking decision should it be necessary. This will be an important role in the exercise.

After reviewing each tag, the disposition of each item should be immediately determined and noted on the red tag. Don't make this a laborious task...do it quickly.

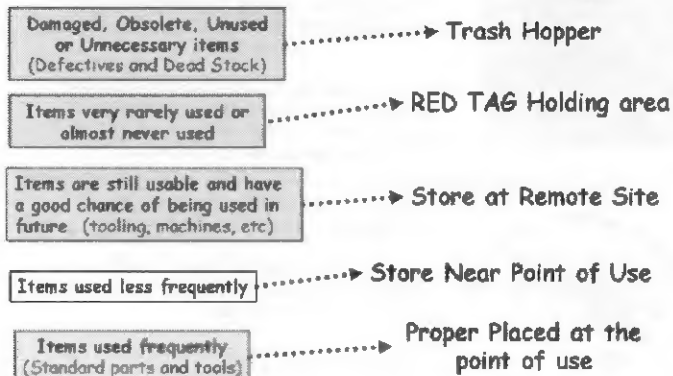
Once this exercise is completed, go back to the shopfloor and dispose of all the items whose disposition is to discard. Often this is traumatic to some, however, to achieve true workplace cleanliness, it is a necessity.

Sometimes there are items which have considerable value or perhaps may be used in the future. In this case, create a RED TAG disposition (holding) area in a non essential part of your plant. This at least gets it out of the workplace. Leave the RED TAG locator on the parts/machine/tool/etc so that you have record of why and when it was tagged.

Periodically review the status of all items in the RED TAG holding area. If not used for a predetermined period of time...get rid of it by selling/transferring or disposal. Don't let this area become the dumping grounds for the plant. Everything here should be on a short term stay basis. Items that need to be retained for specific purposes should not reside here, but instead in long term storage.

To determine the success of your efforts, assess what has been done. Give advice on what else may be accomplished. Be thorough with your assessment. Keep a record of the volume of items removed. The number of dumpsters, scrap barrels, etc. is an indication of how much was accomplished.

Rules of Frequency



The **Rules of Frequency** can be used in conjunction with a Red Tag Session or by themselves to help us initially decide where things belong. It begins the transition to the 2S-Straighten.

As this chart indicates the frequency of the frequency of use is inversely proportional to the distances from the workplace. Putting the high frequency of use parts nearer the workstation could reduce the overall time appreciably. Not rocket science, just plain common sense.

If it is used often keep it close to the worksite.

RED TAGGING Helpful Hints



1. Record all info on RED TAGGED item on RED TAG so that decisions regarding disposition can be made easily.
2. Make sure the RED TAG locators are easily visible.
3. Make sure everyone understands and is consistent on the criteria for RED TAGGING.
4. Discourage arguments on RED TAGGED items.
5. Make the decisions on disposition of RED TAGGED items quickly and according to criteria. NO long arguments.
6. Don't compromise; *"When in doubt...throw it out!"*
7. Do not multiple tag an object.
8. Make reasonable allowances regarding personal items in the workplace. (family pictures, purses, etc) Just make sure they don't interfere with the standard work or egress.
9. Summary the results of RED TAG session. \$ and volume.
10. Remember: BEFORE and AFTER pictures of RED TAG area.

The major objective of the RED TAG campaign is to seal the WASTE to expose it. Then separate what is needed from what is not needed so that we can easily and quickly access the needed items.

RED TAGGING gets us started on the 6S path, however, without constant vigilance and dedication, we can quickly return to the previous state.

Therefore, once the RED TAGGING is complete, compile and post a listing of the standard items that belong in the workplace. This should be posted along side the "after RED TAGGING" picture of the area.

If any item does appear that is not on the listing, it should immediately be RED TAGGED and evaluated.

If you cannot maintain the 1S-Sort, then it is very difficult to move onto 2S-Straighten. Therefore, work hard for the next few weeks to keep only what is needed in the workplace.

Red tagging does not have to be a fixed event. At any time if items find their way into the workplace and DO NOT meet the Red Tag criteria; they should be RED TAGGED.

As Each Item is
Described You will
have 10 seconds to
decide its disposition



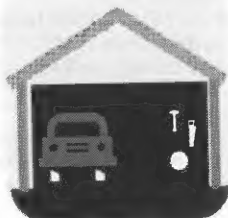
Give it away



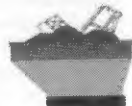
Store Elsewhere



Yard Sale



Leave in Garage



Trash It



Class Exercise #1

Task Time = 15 minutes

Think about your garage or storage shed at home and about all the different items you have located there.

Pick out items that you have had in the garage for about three years and list each one on a separate "post-it" note. Then put each of the notes on the garage sketch on the flip chart.



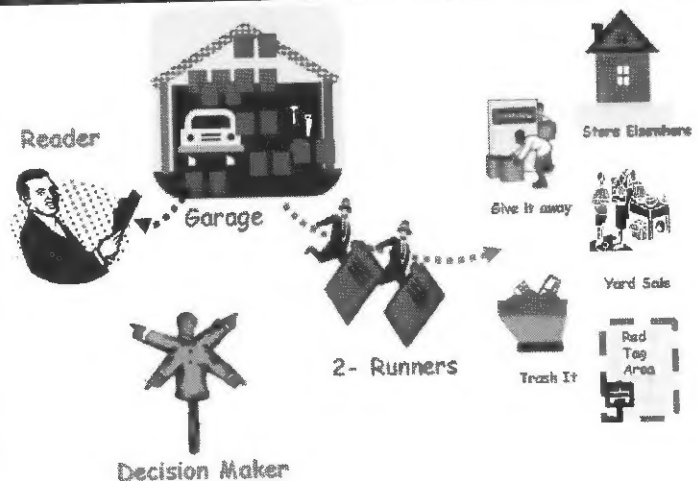
Close your eyes and take a mental walk through your garage. Look at everything.

Be very descriptive: Don't say "a tire", instead say "an old tire with worn tread which fit my ex-wife's car."

Items can be anything, usable or non-usable. Try to list at least 3.

Standard Work for this Exercise:	Time
Before doing anything, close your eyes and take a mental walk through your garage or storage shed. Look around to see WHAT you have there.	2
Identify 10 items that you have had in your garage or storage shed for at least three years and list each one on a separate "post-it" note. Don't think about whether or not you need the items, just jot them down. Again, be specific about what you have listed.	4
Then put each of the post-it notes with the items listed on the garage sketch in front of the room.	1
Select one individual from the group to organize the items in the garage and combine similar items.	1

Standard Work for this Exercise:	Time
Appoint one person from the group to be a final decision maker. This must be someone with the authority and awareness to make a tie-breaking decision should it be necessary. After reviewing each tag, the disposition of each item should be immediately determined and noted on the red tag. Don't make this a laborious	4
After the end of the session, summarize the improvements made.	2
Compare/contrast this to performing 1S in the workplace.	1

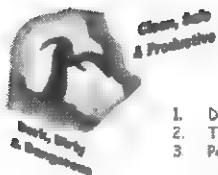


To run the exercise we will require the following volunteers.

Reader: Pull each RED TAG from the garage and read aloud to the entire group.

Runners: Take the RED TAG and place it in the appropriate area as decided by the group.

Decision Maker: If the group cannot decide disposition of RED TAG in 5 seconds; you must make the important choice.



1S Action

1. Divide our work area into Zones (3-7 members/zone)
2. Take "before 6S" pictures
3. Perform initial cleaning and 1S-Sort in area
Use RED TAG Campaign, if necessary
Clean, clean, clean
4. Develop a listing of Standard Items for our Work Zone. What must we have "on hand"?
 - Tools
 - Parts (types and quantity)
 - Supplies (types and quantity)
 - Equipment
 - Post Standard Listing
5. Each Zone will be evaluated daily (6 items on sheet)
6. You must score a "yes" for all 6 items for 15 days in a row. One "no" and you must RESTART the 15 days.
7. If you discover items on the listing that are no longer needed, remove from the zone and revise the listing.
8. Upon successful completion, advance to 2S-Straighten training and action.

Don't become discouraged...this is the toughest part of the 6S's.

Now that we have learned about 1S-Sort, we are going to put this knowledge to use in our work area. Our goal is to transform from Dark, Dirty and Dangerous to Clean, Safe and Productive. To do this we must first separate the things we really need to do our job from everything else. Then we must work hard to keep all the other items from entering our work area.

To form a habit requires over three weeks of vigilance and effort. Therefore, don't expect this to be easy. Everyone must question everything that comes into our area that does not belong. If it's not on the listing, it should be immediately be dealt with.

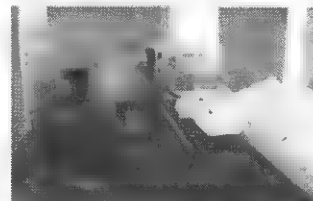
Please notice that this is not a long cumbersome evaluation sheet. There are only six questions regarding the status of your workplace. You are only being judged based upon those issues. Even though your workplace may contain some elements of 2S-Straighten, you will be judged only upon maintaining 1S and basic workplace cleanliness.

During the 1S-Sort, become ruthless when evaluating the items in your work area. Keep only those that you require on a regular basis. Once every 3 months is not a regular basis. By keeping only a few items, it will be much easier to maintain 1S in your area.

Work with your instructor to perform 1S-Sort on your assigned work zone. Practice it diligently for 15 days so you can go on to 2S-Straighten.

Good Luck.

Opportunities outside of Manufacturing



Has anyone seen my stapler?

Sort before you straighten

Attempting to the straighten up the workplace without first separating what YOU NEED from what YOU DON'T NEED, is an exercise in futility. No matter what you do...it will be wrong.

And remember these steps are applicable not only in the manufacturing environment.

Straighten

"Maintaining the right things...the right way"

Understand the STATUS QUO.



Decide where things belong



Decide HOW they should be stored



Insure the rules are obeyed-DISCIPLINE!



After sorting through everything in the workplace and leaving only the essentials, the job is still not complete. What must now be done is organize the remaining items so that they can be easily found, easily obtained and easily returned after use. This concept is not difficult to comprehend. However, in the workplace it is often difficult to do unless these simple steps are followed.

Understand the Status Quo. *What is happening right now? What is needed in the way of tools or supplies. Understanding the standard work of the operator and what tools and materials are required to perform it properly is a good first step.*

Decide WHERE things belong. *Doing a more detailed "Rule of Frequency" application. Look at who uses what and when they use them.*

Decide HOW things should be stored. *Easy to get... easy to put-away... easy to handle? Just because things are easy to find does not mean they are easy to get at.*

WHAT will ensure that rules are obeyed. *Someone must act as the police and insure that all the rules are obeyed. This will mean periodic inspections and discipline. Without this all is for naught.*

Understanding the status quo

"Take a look at what's going on NOW"

Start With ANALYSIS

Distances to parts and tools

Frequency of Use

Sequence of Use

Time Required to Get and Put-away



Standard Work is KEY!

Our movement into 2S must begin by analyzing how people get things out and put them away, where they get them from and why it takes so long. While it may be routinely obvious, this study must be done in GEMBA (at the workarea). Don't try to draw sketches on a shop layout from memory. It doesn't work. Also, be sure to study new operators along with veterans since often, old habits often die hard.

Study the factors which impact the productivity of the workplace. These would include:

Distances to parts or tools

Frequency of use

Sequence of Use

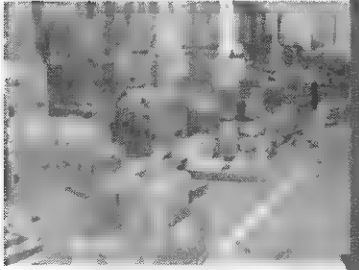
Time required to obtain & put-away

While the time values for any one get & put away may seem insignificant, the frequency and cumulative effect of all the activities will be impacting the productivity of the work-center. This is the reason for analysis in gemba. Do we need a fork lift? Must we unlock a cabinet? Obtain special handling devices? Do we need assistance? Do we need to count what we take? All of these will uncover kaizen opportunities.

Ease of finding.

Organization is the KEY

Before



After

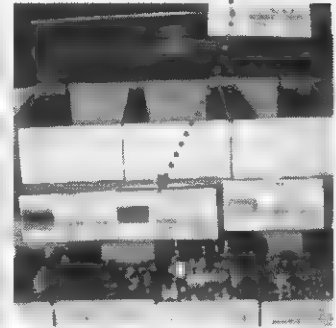


If you had only 30 seconds to find the unit...
...which storage system would you choose?

Although the picture on the right is an improvement, there is still opportunity for better designation of the proper place for each part.

Everything's in its Place

Each part has an address
High Level of Visibility



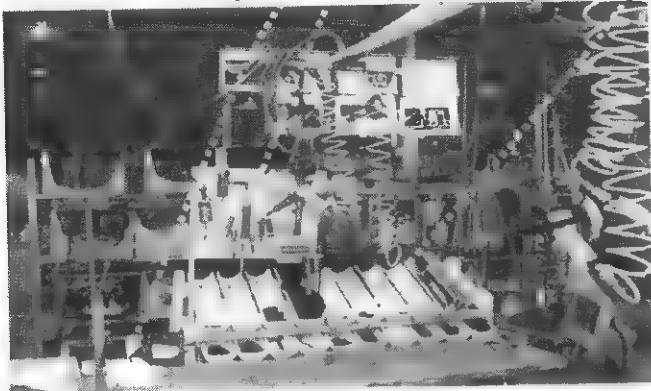
Ease of finding.

Here each address location in the supermarket contains a magnetic label with a part name, number, description and picture, replenishment quantity, reorder quantity and vendor.

When the part reaches the reorder quantity, the magnetic label is placed on a reorder board and is replenished. When the parts arrive, they are replaced in the rack along with the order card.

Build Standards Into Workplace

Controlled Parts
Controlled Locations
Controlled Sequence



Notice the set location for each tool and part. By having the proper parts delivered in the proper quantities, at the proper time and in the proper sequence, the ability to sustain standard work is extremely enhanced. Also, think about training of new operators. The sequence is built into the workplace.

Go back to the pyramid of visual management on page 3. This is the difference between posting a standard work document and building the standards into the workplace. This is one step higher than just posting the standard work.

The next step might be designing an assembly jig or fixture that will only allow the proper assembly method.

Think about this... "how can we make the workplace tell the operator what to do next?" Think about how this would improve the training of new operators or locking in best practices.

One word of wisdom that really sets the stage for building standards into the workplace is:

*"Make it harder to do the job the **WRONG** way than it is to do it the **RIGHT** way"*

Maintain control



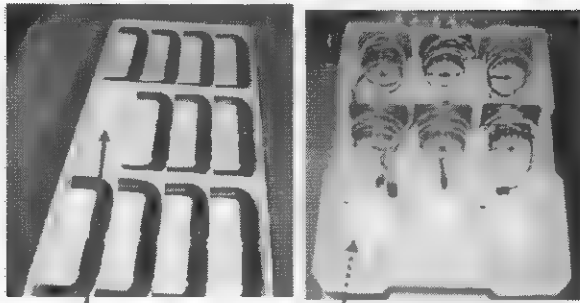
Controlled Quantities
Controlled Locations
Easy to Get



By limiting where and how much material may be stored, we are one step closer to a true pull system.

A die hard rule **MUST BE**: *"Put **NOTHING** on the floor"*
When you observe something setting on the floor, it should be an immediate indication that something is **WRONG**. That is the power of visual management.

Maintain control



Abnormality easily seen

Controlled Quantities
Visual Management

As mentioned previously, 6S is all about visual management. Making it easy for anyone to understand the difference between NORMAL and ABNORMAL.

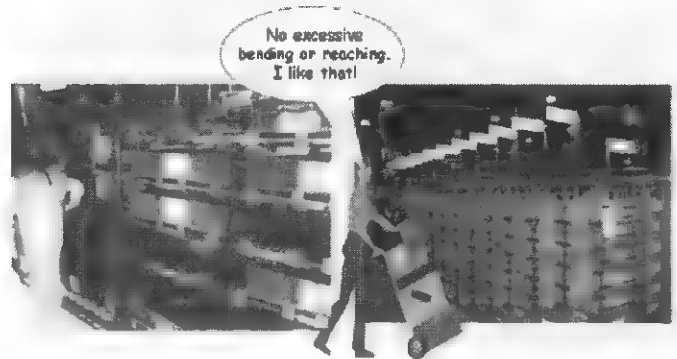
Look at the picture of the handles above. It is easy to observe that something is wrong. Imagine if these handles would have just been thrown into the tote bin. The omission would not have been obvious.

Think about buying a dozen eggs or a 12 pack of soda at the supermarket. Opening the egg carton to check for breakage is a common routine, however, I would doubt that very few people actually count to make sure there are a dozen eggs in the carton. If all the spaces are filled, you know the count is correct.

Just like the example above, just like my egg carton example, Visual management eliminated the need to count the handles and the abnormality of a missing part is easily observed.

Can you think of other areas outside of the work environment where determining the correct count is made easier through visual management?

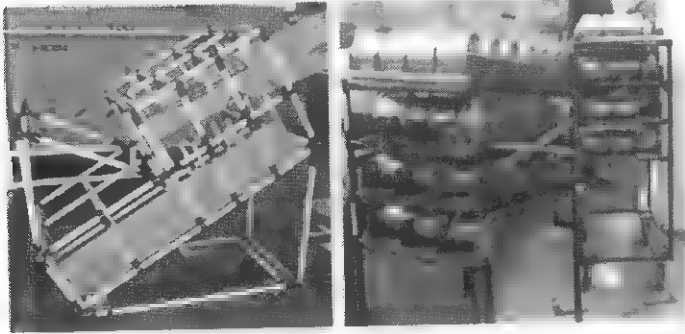
High Use or Heavy Parts are EASY to Obtain and Put-away



Designing a supermarket or storage system for parts must take into account some key factors.

- The high volume parts should be stored closest to the POU (Point of Use)
- These same high volume parts should be stored in the easiest to access part of the supermarket. Between the shoulders and knees.
- Heavy or difficult to handle parts should also be stored in areas where their retrieval and return is simplified.
- Adequate clearances should be given and the part oriented so that obtaining it or the container is easy.
- Every location in the supermarket should have an unique address. This address becomes the means for finding the part. Avoid the urge to layout supermarkets based upon part numbers or names. This violates items 2 & 3 above.
- The same address should be located on the container. Then when the container is restocked, it can easily be returned to the correct address in the supermarket.
- The supermarkets should be FIFO. This means being able to replenish the supermarket from the back side so the materials in the supermarket do not become stagnant.
- Finally, the supermarket must have a replenishment system. If I pull a tote of 40 parts from the supermarket, there must be a means (information flow) for those parts to be replenished.

Easy to LOAD & UNLOAD Easy to TRANSPORT



Use of lightweight carts to facilitate material flow is significantly superior to the conventional means of forklifts and roller conveyors.

A good rule of thumb regarding carts is that they should never weigh more than what they transport. Above the use of Cre-form materials makes a material delivery system that is lightweight presents the parts in the proper orientation for the operator.

This is one type of cart design that delivers a small time interval of parts to a specific location on the assembly line.

Everything You Need, Kitted as a Unit on a Cart



No Line Stoppages due to *Missing Parts*

This is a slightly different use of a parts cart for delivery to the line. In this case the cart contains one unit's worth of parts. It is often called a KIT Cart. Kit carts contain all the key parts required to assemble a unit, except perhaps for things like fasteners, tape, labels, etc. These items are typically supplied in a fixed amount since they often are universally used. (See tote bins in picture above).

Kit carts aid in control by assuring that all the necessary parts are present and properly staged before assembly begins. As the kit carts are typically filled by the waterstrider, it eliminates the decision making on the part of the operators. They just assemble what is on the cart.

Everything You Need, Kitted as a Unit in a Tote



No Line Stoppages due to *Missing Parts*

This is a slightly different way to deliver parts to the line. In this case the TOTE contains one unit's worth of parts. The TOTE contains all the key parts required to assemble a unit. In this example, although the parts in the kit might be used on other units, the parts as a kit are designated to a particular model or unit.

TOTE are usually set up with set locations, as can be seen, to make it readily visible that all parts necessary are contained in the TOTE. If something is missing...it is readily noticeable. (See tote bins in picture above).

They can also act as a work sequencer, if the parts are arranged and marked in the order of assembly. While this may sound a little too much detail, sequencing makes it easier to train new members and acts as a check on adherence to standard work.

The TOTES are typically filled by the waterstrider, at a supermarket which resembles a buffet line at a restaurant. See next slide.

Common items used on nearly every model; like fasteners, tape, labels, etc. can be handled differently. These items are typically supplied in a fixed amount since they often are universally used.

Assembling the Kits Just like a Buffet Line



No Line Stoppages due to *Missing Parts*

This is a slightly different use of a parts cart for delivery to the line. In this case the cart contains one unit's worth of parts. It is often called a KIT Cart. Kit carts contain all the key parts required to assemble a unit, except perhaps for things like fasteners, tape, labels, etc. These items are typically supplied in a fixed amount since they often are universally used. (See tote bins in picture above).

Kit carts aid in control by assuring that all the necessary parts are present and properly staged before assembly begins. As the kit carts are typically filled by the waterstrider, it eliminates the decision making on the part of the operators. They just assemble what is on the cart.

Moving upstream in the process requires assembling the kits to take to the line. Here proper organization of the supermarket for parts makes it easy to replenish the kits when required.

The key to all this is NOT designing the supermarket before you really understand your customer's needs. Once you understand what goes in the tote or on the cart and the sequenced in which the parts will be used; only then are you ready to design your supermarket.

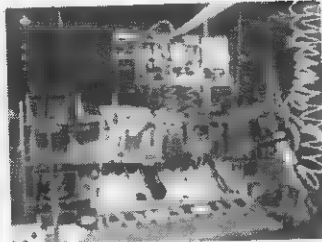
Examples

Home Locations For TOOLS

The Tool is always in the same location



Color Match Visibility
Same Color



Controlled Location
Assured Return

Whether or not the parts you need are in stock must be discernable at a glance. Every assigned storage space should have reorder points clearly marked. Cards for reordering should be right there. The quantity on hand is ultimately dependent on the time to restock. If parts are used elsewhere indicate this in the storage area.

Once things are organized, they must be maintained. After changes are made to an area, it may take some time for the members to become familiar with these changes. Therefore take some time and practice the art of get outs and put-aways. With practice the times for each will be reduced and the practice will become habit. This practice can also highlight things that still need to be done.



Clean, Safe
& Productive

2S Action

1. Continue to use the work area Zones, as before unless change is warranted (3-7 members/zone)
2. For each of the remaining items, determine their frequency of use and then assign it a proper location. Be sure to assign an address, if applicable
 - Tools (shadow boards, shelf locations, etc.)
 - Parts (bins, carts, totes, etc.) Also, how will the quantities be controlled and position maintained.
 - Supplies (shelf, cabinet, totes, etc.) Also, how will the required amount be controlled (min-max)
 - Equipment (Floor markings, other)
 - Standard Listing (if we do 2S-Straighten properly, it will become a visual system and the standard listing will not be needed.
3. Each Zone will be evaluated daily (6 items on sheet)
4. You must score a "yes" for all 6 items for 15 days in a row. One "no" and you must RESTART the 15 days.
5. If there are items not needed, remove them.
6. Upon successful completion, advance to 3S-Scrub.

Having successfully completed 15 consecutive days of 1S-Sort, you have discovered that of all the items you used to have in the workplace only a significant few were needed. You may have even trimmed the number from your first listing.

Now that we are down to the essential, it is time to organize them in a fashion that really makes sense. Our goal in this step...to give everything a home location and then keep it in that location. Therefore, instead of having to constantly refer to our standard listing to determine what does or doesn't belong in the workplace; we should be able to tell..at a glance.

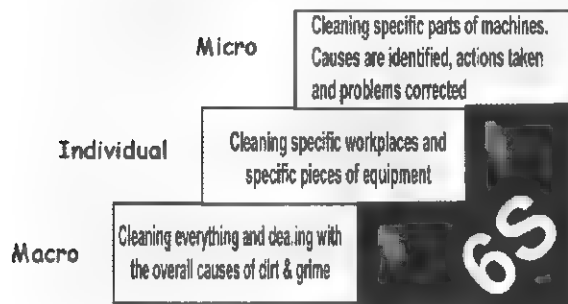
If things enter our department and do not belong, they will not have a home location and will be readily visible on the floor. This way they can be dealt with immediately. The best method of indicating home locations is best left up to each improvement team, however, there are some common method used for different types of items. Shadow boards, signboard shelving, min-max bins, flow through rack and floor outlines are just a few of the ways to specify a home for parts and tooling. The key is being able to know when something is out of place or there are too many or too few. This is the beings of "visual management."

Work with your instructor on 2S-Straighten to better organize your workplace and then practice it and 1S without fail for 15 days.

Good luck.

Getting to Clean

Three Step Approach to a Clean Workplace

*"Cleaning is a form of inspection"*

Doing a cursory cleaning of your department from the end of a broom or air hose does little to address the real issue of contamination. An effective 6S or TPM (Total Productive Maintenance) program goes much deeper. We must examine the equipment and clean as necessary. This routine may uncover abnormalities before they become major problems. By going through this routine every day or week, we minimize the extent of cleaning or possible damage because we address it while it is small.

As we move towards a Preventive type 6S, many of the things we do will be similar to what is taking place in Total Productive Maintenance. Instead of finding ways to improve the cleaning process, we find innovative ways to prevent the process from requiring cleaning at all. To get there we must use a disciplined attack.

Macro Level: This level cleans everything in the department and deals with some of the overall cause of contamination. Often we are content to minimize rather than eliminate. Other times we look to find ways to reduce time for clean-up. Often the result is keeping the workplace clean by improving the method of cleaning or eliminating. If we wait for a year to scrape off the gunk and grime it is hard telling what will be discovered.

Individual Level: This level begins to narrow the focus to specific work centers or machines. Again the call is to set up standard routines for cleaning. This insures that the machine or work center stays clean and also helps to identify potential maintenance and safety issue.

Think about how you go about your personal cleaning routine every day. More than likely as you take a bath or shower, it is done the same way every day. We need to take that same level of standard work practice to our job site.

Micro Level: This level begins to identify the specific parts of the process that create the contamination in the first place. Once identified, we can perform corrective action and keep the contaminates from migrating to the workplace.

Doing the Job

"The pathway to workplace cleanliness"**Assign Zones of Responsibility****Develop Standard Routine****Set Time Limits for Cleaning****Everyone begins at same time**

Clean-up of the workplace has often been relegated to the last five minutes of the shift with no expectations for the job. This method accomplishes very little and often only redistributes the dust and dirt.

What is needed is a structured campaign that not only keeps the workplace clean but also provides a periodic and thorough observation of equipment and processes. The above outline is a guide to achieving this objective.

Zones of Responsibility: Everyone should be assigned a designed zone within the area and be made responsible for keeping it in 6S order. Key considerations should be the time it takes to do daily maintenance, and the impact the member has with respect to keeping the area clean. In other words, everyone should clean their own room. These zones should be periodically checked to insure that they are maintained.

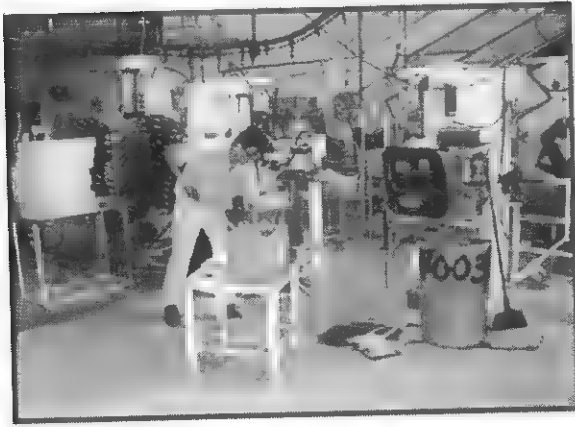
Standard Routine: Just because many of the daily cleaning operations do not add value, does not mean that we cannot create standard work for them. By doing this we can find ways to improve or eliminate the tasks we are doing.

Set time Limits: If anyone has kids they know that if you allow them all day to clean their rooms, that is exactly how long it will take. Therefore, be sure to determine and indicate the allow time to perform the daily activity with regards to 6S. Be knowing this, we can improve the time.

Start together: This makes it easy to see if proper work assignments have been made with regards to daily maintenance. Adjustments can be made.

Doing the Job Daily

A little every day avoids a major clean-up campaign



**Do clean-up the messes
While they are still small
But discover good ways
For no cleaning at all.**

As you perform your daily 3S, examine what really causes some of the major messes in your area.

- Is something not functioning properly (dust collector, slug conveyor, etc)?
- Are waste containers, not sufficient or improperly located?
- Is standard work being practiced?
- Is it migrating from other areas?

Ask yourself; "Are there ways to prevent or minimize the impact?"

**The best way to keep things clean...
...is by not letting them get dirty."**

Equipment 6S

"The First Step to Self-maintenance"

?

Identify areas which need to be cleaned and inspected.



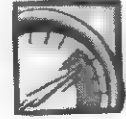
Teach operators "how" to clean and inspect the machinery and equipment.



Develop checklists that address these areas.



Make sure operators understand "how" the equipment they use works



Fix problems that are discovered.

Identify and analyze the problem areas first. Then make decisions on how certain items will be cleaned and inspected. With limited time available, it is important to address the major areas first.

While cleaning of equipment may turn up problems, it is very important that certain critical items be checked during each 6S activity. To avoid omission of these items, a checklist should be used. While cleaning and inspecting of equipment may seem like an easy task, it is very important to train members in what and how to perform it. Items such as critical areas, proper cleaning tools and fluids, standards of cleanliness and wear areas must be covered.

Members also need to understand the workings of the machinery that they use everyday. Items such as lubrication required, proper belt tension, location of switches, etc., should be known by the worker.

When problems are discovered during the 6S activity, make sure that they are addressed immediately.





3S Action

1. Continue to use the work area Zones, as before unless change is warranted (3-7 members/zone)
2. For each remaining item in the zone, ensure the proper storage location. Be sure to assign an address if applicable.
 - Tools
 - Parts
 - Supplies
 - Equipment
3. For each work zone.
 - Determine what must be cleaned and inspected daily.
 - Kaizen for better ways of performing these tasks
 - Distribute it among operators.
 - Develop and post standard work for each sub-zone.
4. Each Zone will be evaluated daily (6 items on sheet)
5. You must score a "yes" for all 6 items for 15 days in a row. One "no" and you must RESTART the 15 days
6. Perform the standard work for cleaning/inspecting every day.
 - If there are items not needed, remove them.
 - Kaizen the clean/inspect process.
7. Upon successful completion, advance to the next S.

By now your zone and department should be beginning to show major signs of improvement. Only items that belong in the workplace are present making it much easier to get what you need, when you need it. You may notice, however, that while the department is organized, it periodically is not the cleanest place. Enter 3S-Scrub.

Time is allowed in everyone's workday to clean there assigned area. In some cases it is more than enough time while in others (dusty & dirty) it is far from enough. But like any improvement effort, before we can improve...we must develop existing standards. Once done, we can time the job, analyze it for improvements and reduce the time.

Therefore, with the help of your instructor, develop the standard work for cleaning each work station or zone. Draw the steps on a standard work sheet and list the steps on a work combination sheet. Have another team member time you doing each step and record on the work combination sheet. We have now developed standard work for this operation. If you have ideas for improvement...implement them.

Practice doing 3S-Scrub for 15 days using your newly developed standard work.

Once you are able to effectively practice and maintain 1S-Sort, 2S-Straighten and 3S-Scrub, you have succeeded in doing the most difficult of the 6S's.

Good luck!

Safe
45

Basic Attributes of a Safe Workplace

When performing a 6S activity at a workplace, be sure to investigate, identify and correct possible hazards associated with the following:

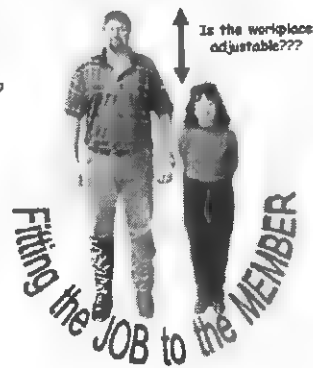
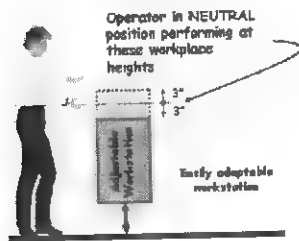


If we follow the first three S's, it is almost guaranteed that our workplace will be a safe place. However, as a double check, be sure to examine the items listed to insure that it is so.

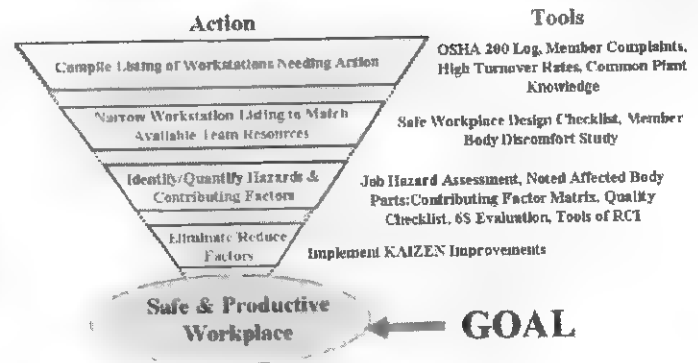
Adaptable WORKPLACE

Don't expect operators to adjust to the workstation. This is asking for trouble.

Workstations must be easily adaptable to the physical differences of members.



PROCESS

What
To Do

Members at HNI come in all shapes and sizes. Just like the automobile can adjust to accommodate different sized drivers, so must HNT's workplaces accommodate different sized members.

The focus is to increase the participants awareness and give them the tools which will assist them in fitting the JOB to the MEMBER instead of forcing the member to adjust to the demands of the task/job.

We must attempt to design each workstation using proper health, safety, ergonomics and human factors technology. Workplaces must contain all tools and equipment required to fit the capabilities and limitations of the members working with them. This is a difficult challenge which must be addressed.

To improve the human workplace interface requires specific actions to fit the member to the job. Although the details of this process are better explained in the Ergo-RCI Do-er's Manual, it consists of a few steps and tools to assist with each of those steps.

However, the key foundation to the ERGO-RCI is the absolute necessity for an organized workplace and defined, practiced standard work. Without both of these items, the ergonomic improvements will be of little benefit.

Standardize

VISUAL MANAGEMENT: *Being able to tell the difference between "normal" and "abnormal" and act accordingly*

Before Major Problems Occur!



Visual Management makes use of our dominant sense of sight to ensure the rules are recognized and followed.

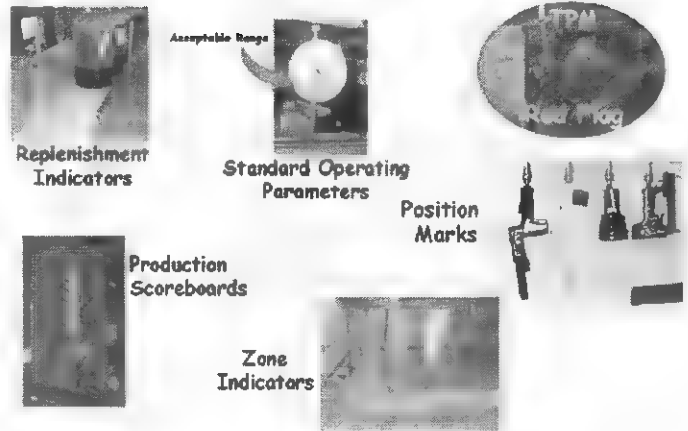
Performing a 6S activity in a plant or department can dramatically improve its organization, housekeeping and safety. If not maintained, however, it can easily revert to its former state.

Standardizing will provide constant repetition of the first 4S's creating a new level of common sense regarding how we maintain our workplace. This standardizing will create "visual control" to highlight abnormalities as they occur. As rules regarding the first 4S's are established, it is very important that they are easy to follow.

By utilizing "visual management" we can make use of our dominant sense of sight to insure that the rules are followed. Even an outsider trained in 6S can observe the workplace and spot an abnormal situation.

Visual Control Tools

"Making Understanding Easy"



Standard Operating Parameters: With a the normal operating range marked on the gauge, it is very easy for the operator to observe if the process condition is correct.

Position Markers - The correctly marked storage position for machines, skids and tools can make it easier to find them when required. If not there, they must be in use.

Preventive Maintenance Indicators - The RED Flag indicates there is a TPM issue that requires attention. Standardization of indicators make PM much easier. The storage locations should use same markings. Tools can also be marked to indicate when they are scheduled for re-calibration and testing. A tag such as this can insure that parts will continue to meet specifications.

Zone Indicators: These come in many varieties but the main objective is to visually identify potential hazards. Here an operator could walk into the path of an overhead conveyor would it not be for the zone markings. Doorways, aisle, machine swing areas and the like can easily be marked to prevent potential incidents.

Production Scoreboards: Ever go to a sporting event without a scoreboard? As your attentions is drawn to the action on the field, often you lose track of the score, time left, statistics, etc. It is no different in a production environment. Just like at a football game, it is helpful to know the score, before you run out of time.

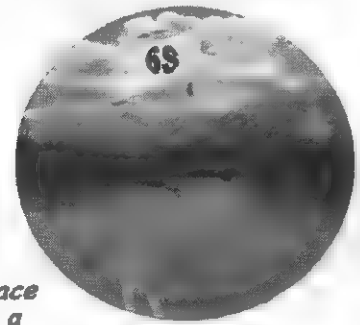
Replenishment Indicators: If a line runs out of materials the downtime and lost productivity can be devastating. Therefore, in this example it is easy to see when the material should be replenished. As you can see it has entered the "red zone". Hopefully replenishment is on the way.

Kinds of Visual Controls

- Displays to prevent people from making errors
- Danger alerts
- Indications of where things should be put
- ◆ Equipment designations
- ◆ Caution and operating reminders
- ◆ Preventive maintenance displays
- ◆ Standard Work Documents

Use your ingenuity to come up with innovative ways of making everything as intuitive (immediately understandable) as possible.

Visibility is Critical



"A productive workplace does not have to be a dirty workplace."

Getting to 6S is not an easy task. Sustaining the efforts it took you to arrive at here is also quite difficult. It takes constant vigilance and perseverance.

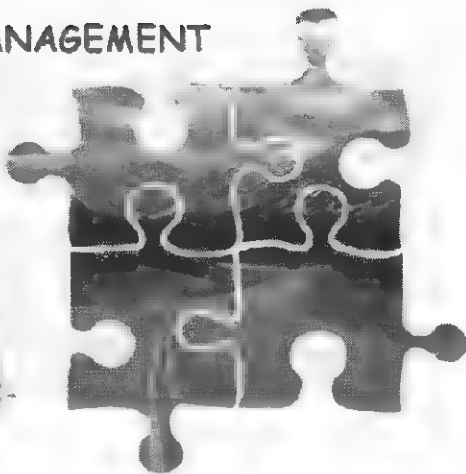
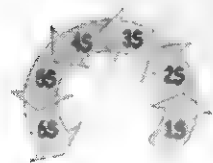
Once your workplace is clean, organized and maintained, you will quickly forget how terribly bad it was before. Therefore, take some before, during and after pictures of the worksite. These become excellent visual tools to promote the 6S program and will also help prevent backsliding. Post them prominently on the department's visual display board.

If your 6S efforts in the workplace have generated reductions in materials (lubricants, cutters, machine parts, etc.), time, amount of waste, or extent of personal injuries; document and display the results. Quantifying these reductions will add validation to your accolades of the 6S process.

Occasionally problems will arise that, if left undone, will begin to undermine 6S gains. To combat this effect, attach attention-getting stickers on places needing special attention. It beats constant verbal reminders. Being a "visual tool", it continues to tell workers what needs to be done long after a verbal notice would have been forgotten.

The Road to VISUAL MANAGEMENT

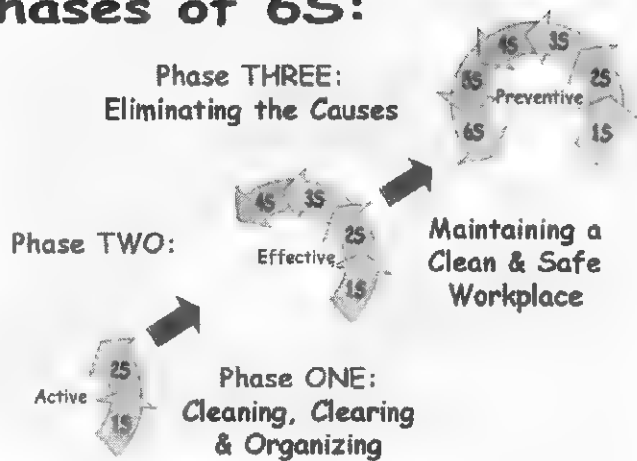
Assembling
the Pieces
One at a
Time will get
us there



The Road to a Visual Workplace is not a short one. As Confucius said: *"A Journey of a thousand miles begins with a single step."* In other words, don't expect this to be a short trip or a one time experience. You will constantly find ways to improve the understanding and visual nature of the workplace.

The key is continual persistence in developing a workplace where it is very easy to distinguish what is Normal from what is Abnormal.

Phases of 6S:



Sustain
6S

Highlighting Organization



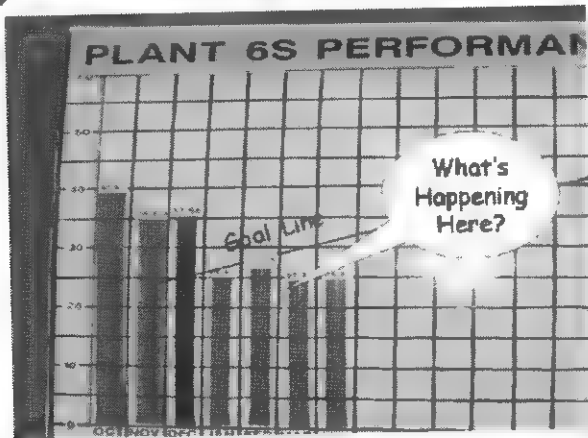
Sustain
6S

Recognizing Accomplishments



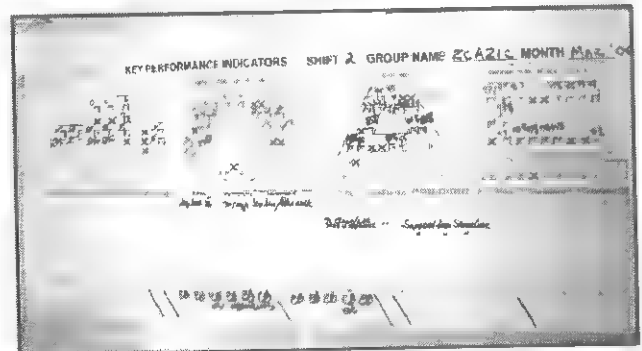
Sustain
6S

Displaying Progress



Sustain
6S

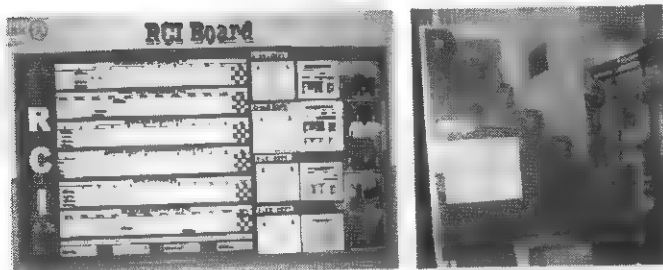
Communicating Performance



KPIs: Key Performance Indicators

Sustain
6S

Sustaining Enthusiasm



Have a...



Appendix

Red Tag Master
Red Tag Criteria
1S Evaluation Sheet
2S Evaluation Sheet
3S Evaluation Sheet
Training Session Evaluation

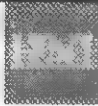


Place in binder notebook.

Company:	RED TAG	 HNI Corporation
Plant:		
Factory:		
Tag No: _____		Date Issued: _____

Classification	1. Raw Materials 2. Work In Process 3. Purchased Parts 4. Finished Products 5. Machinery/Equipment 6. Molds/Dies/Fixtures		7. Processing supplies 8. Oils/Solvents/Chemicals 9. Tools/Carts/Furniture 10. Pallets/Boxes/Cartoning 11. Personal Items 12. Other _____	
Item Description				
Quantity/Value	_____ items	Value per item: \$ _____	Total: \$ _____	
Reason For Red Tagging	1. Unnecessary 2. Defective 3. Non-Urgent		4. Left-over Material 5. Unknown Reason 6. Other: _____	
Disposition Required	1. Discard 2. Sell/Transfer 3. Long Term Storage		4. Holding Area 5. In Cell Storage 6. Other: _____	
Reviewed by: (initials/date)				
Action Taken			Date:	
			By:	

Attach to RED TAGGED item.

Company:	RED TAG Locator	
Plant:		
Factory:		
Tag No: _____		Date Issued: _____
Location:	Description:	
Reason Tagged:		

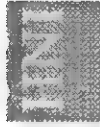


Before you begin to RED TAG, it is important to develop the criteria as to when you will RED TAG an item. Below are the various categories with examples of each. Add other examples that will be representative of your location.

Examples: **Raw Materials:** Tag if... > 5 days supply.
Molds/Dies/Fixtures: Tag if... they have been unused for 1 month.
Processing Supplies: Tag if... > than one day supply

Classification	Examples		Criteria: Tag if...
1. Raw Materials	Steel Coils Particle board Laminate	Wood/veneer Paints/Finishes	
2. Work In Process	Blanks Sub-Assemblies	Welded parts	
3. Purchased Parts	Locks Casters Foam	Screws	
4. Finished Products	Desks Fireplaces Chairs	Laterals Panels	
5. Machinery/Equipment	Press brakes Welders Rivetors	Sewing Machines Screw Guns	
6. Molds/Dies/Fixtures	Weld fixtures Brake bars Dies	Molds Gages	
7. Processing supplies	Sanding discs Blades Drill/router bits	Gloves Weld tips/buttons	
8. Oils/Solvents/Chemicals	Oils Greases Washer chemicals	Cutting fluids Paints	
9. Tools/Carts/Furniture	Pallet jacks Handcarts Chairs	Desks Handtools	
10. Pallets/Boxes/Cartoning	Pallets Corrugated matl. Plastic bins	Cartoning Skids	
11. Personal Items	Radios Lockers/toolboxes	Coats/hat	





1S - Sort Evaluation Sheet

Must achieve a perfect score for 15 consecutive days before advancing to 2S – Straighten

Plant: _____
Factory: _____
Area: _____

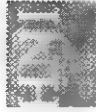
Day	Only Standard Items in Workplace (per listing)					Shopfloor Clutter		Notes	Inspect By
	No.	Date	Tools	Parts	Supplies	Equipment	Workplace	Floor/aisles	
1	/								
2	/								
3	/								
4	/								
5	/								
6	/								
7	/								
8	/								
9	/								
10	/								
11	/								
12	/								
13	/								
14	/								
15	/								
Successful days of 1S- Sort out attainment.	Actual Month/Day the evaluation is taken.	Are only LISTED hand tools, fixtures, jigs, power tools, measuring tools, templates etc. in the work area?	Are only LISTED fabricated parts, raw material or purchased parts in the area? Are they in the correct quantities or less?	Are only LISTED items such as, gloves, aprons, protective equipment, grinder discs, weld tips, etc. in the area? And in correct quantity or less?	Only LISTED machines, handling equipment, office equipment, chairs, tables, personal items, etc. in work area?	Workplace is mostly free of clutter except for process items dropped during last few hours? Most process scrap has been removed?	Are floors/aisles mostly free of clutter and debris? Does the operator have adequate means of egress?	If any of the checks were only marginal, they should be noted in this column so that corrective action can take place.	Initials of inspector.

Members trained and assigned to this area (please list):

Successful Completion of 1S-Sort Stage:

Date: _____ Approved by: _____





2S - Straighten Evaluation Sheet

Plant: _____
Factory: _____
Area: _____

Must achieve a perfect score for 15 consecutive days before advancing to 3S -- Scrub

Day		Standard Items Organized in Workplace (per listing)						Shopfloor Clutter		Notes	Inspect By
NO.	Date	Tools	Parts	Supplies	Equipment	Workplace	Floor/aisles				
1	/										
2	/										
3	/										
4	/										
5	/										
6	/										
7	/										
8	/										
9	/										
10	/										
11	/										
12	/										
13	/										
14	/										
15	/										
Successful days of 1S- Sort out attainment	Actual Month/Day the evaluation is taken.	Are standard tools organized via shadow boards, etc.? Are they in use? Is it easy to see that rules are obeyed?	Are there designated locations & addresses for parts and raw mat? Is standard quantity of parts maintained? Are exceptions visible?	Are there designated locations & addresses for supplies in use? Are supplies maintained at proper quantity. Are exceptions visible?	All equipment has standard location? Is mobile equipment returned to a standard location after use?	Workplace is mostly free of clutter except for process items dropped during last few hours? Most process scrap has been removed	Are floors/aisles mostly free of clutter and debris? Does the operator have adequate means of egress?	If any of the checks were only marginal, they should be noted in this column so that corrective action can take place.	Initials of Inspector.		

Members trained and assigned to this area (please list):

Successful Completion of 2S-Straighten Stage:

Date: _____ Approved by: _____





3S - Scrub Evaluation Sheet

Must achieve a perfect score for 15 consecutive days before advancing other S's.

Plant: _____
Factory: _____
Area: _____

Day	Standard Items Organized in Workplace (per listing)					Shopfloor Clutter		Notes	Inspect By
	No.	Date	Tools	Parts	Supplies	Equipment	Workplace		
1	/								
2	/								
3	/								
4	/								
5	/								
6	/								
7	/								
8	/								
9	/								
10	/								
11	/								
12	/								
13	/								
14	/								
15	/								
Successful days of 15- Sort out attainment.	Actual Month/Day the evaluation is taken.	Are standard tools organized via shadow boards, etc.? Are they in use? Is it easy to see that rules are obeyed?	Are there designated locations & addresses for parts and raw mat? Is standard quantity of parts maintained? Are exceptions visible?	Are there designated locations & addresses for supplies in use? Are supplies maintained at proper quantity. Are exceptions visible?	All equipment has standard location? Is mobile equipment returned to a standard location after use?	Do standards exist for the maintenance of zone? Is workplace clean and organized? Do spills get cleaned up quickly & thoroughly?	Are floors/aisles entirely free of clutter and debris? Are egress lanes well marked and not violated?	If any of the checks were only marginal, they should be noted in this column so that corrective action can take place.	Initials of inspector.

Members trained and assigned to this area (please list):

Successful Completion of 3S - Scrub Stage:

Date: _____ Approved by: _____

Evaluation Sheet

Workshop Session _____

Location: _____ Date: _____

1. What is your overall rating for this Lean workshop? (Please circle one)

No Value	Limited Value	Some Value	Considerable Value	Significant Value
1	2	3	4	5

2. My reasons for giving this rating is:

3. What did you like the **BEST** about this workshop?

4. What did you like the **LEAST** about this workshop?

5. List **TWO** key take backs from this workshop.

6. How did each of the following contribute to your learning for this workshop?:

Category	Very Poor	Poor	Somewhat Effective	Effective	Very Effective
Knowledge of Presenter	1	2	3	4	5
Presenter's Influence on Subject	1	2	3	4	5
Program Content – Class Materials	1	2	3	4	5
Use of simulation to drive learning	1	2	3	4	5
Use of Classroom Exercises	1	2	3	4	5
Handouts or Workbook	1	2	3	4	5
Challenged my thinking	1	2	3	4	5
Assistance (Presenter)	1	2	3	4	5
Assistance (Company/Plant)	1	2	3	4	5
Assistance (Consultant)	1	2	3	4	5
Helped me learn something new	1	2	3	4	5
Gave me something I can use	1	2	3	4	5

7. What support do you need to continue Championing "Lean Enterprise" in your operating business/SBU?

8. List some suggestions on how we may improve this workshop (Use additional page for comments, if necessary)

Please return to facilitator before leaving workshop.